

ACCELERATOR DIVISION DEPARTMENT PROCEDURE

IOTA/FAST DEPARTMENT

ADDP-FF-0003

FAST CONTROL ROOM ON-THE-JOB TRAINING (OJT)

RESPONSIBLE DEPARTMENT: IOTA/FAST Department

PREPARED BY: 
Dean R Edstrom, Jr

DATE: 9/12/17

REVIEWED BY: 
Darren J Crawford

DATE: 9/13/17

APPROVED BY: 
Alexander Valishev

DATE: 9/13/17

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Revision History

- 1) 9/12/2017 - Existing OJT updated to include 300 MeV operation and put into ADDP format.

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1.0

PURPOSE AND SCOPE

The following checklist is provided to ensure basic operations training for Fermilab employees outside of the FAST operations group to facilitate running of the Accelerator Division Research & Development Accelerator (ADRDA) chain.

2.0

AUTHORIZED PERSONNEL

This training shall be administered by FAST Operations Group (see section 3.6) with each intended operator. Upon record of completion, the Fermilab employee being trained becomes a qualified operator, though the operations schedule remains at the sole discretion of the FAST Operations Group.

A list of qualified operators shall be maintained by the IOTA/FAST Department Head and qualifications shall be cleared in the event of major changes to the configuration of the ADRDA or at the discretion of the IOTA/FAST Department Head.

3.0

ON-THE-JOB TRAINING (OJT)

3.1

Operating requirements

_____ Read the FAST Facility Beam Permit and sign/ID #/date the back of the page.

_____ Read the FAST Facility Run Condition and sign/ID #/date the back of the page.

_____ Rad Worker training completed.

3.2

Sequencer (N43)

3.2.1

Turn-On - 50 MeV Electron Beamline

_____ Turn on the FAST 50 MeV beamline from N43 and understand each step:

_____ Clock-in - Starts the run clock

_____ UV Laser-on - Checks seed laser, turns on IR amplifiers, establishes UV

_____ Beam switch is controlled by the Main Control Room (x3721)

_____ Hysteresis clears for all major magnet groups - Trim, Quad, Bend

_____ RF Gun HLRF turn-on / ramp

_____ Dark current monitored on ramp

_____ RF Gun phase scan - Performed at nominal gradient

_____ CC1 HLRF turn-on and ramp

_____ CC2 HLRF turn-on and ramp

- _____ RF phase scans - Know what they should look like
 - _____ CC1
 - _____ CC2
 - _____ Verify beam to the 50 MeV absorber (LEA)
 - _____ Make a logbook entry with summary displays as directed
- 3.2.2 Turn-On - 300 MeV Electron Beamline
 - _____ Turn on the FAST 300 MeV beamline from N43 and understand each step:
 - _____ Cryomodule turn-on and ramp
 - _____ Cryomodule phase adjustments
 - _____ Hysteresis clears for all major magnet groups - Trim, Quad, Bend
 - _____ Verify beam to the 300 MeV absorber (HEA)
 - _____ Make a logbook entry with summary displays as directed
- 3.2.3 Turn-Off - Electron Beamline
 - _____ Turn off the FAST electron beamline from N43 and understand each step:
 - _____ To be run in entirety if any part of the electron beamline has been turned on
 - _____ Laser system
 - _____ RF Gun HLRF system
 - _____ CC1 HLRF system
 - _____ CC2 HLRF system
 - _____ Cryomodule
 - _____ All major magnet groups - Trim, Quad, Bend
 - _____ Verify that all systems have been turned off
 - _____ Make a logbook entry with shift plot (toroid summary from clock-in)
- 3.3 Systems
 - 3.3.1 Instrument air
 - _____ Know that the transverse profile monitors, vacuum valves, and cryogenics system valves use compressed dry air, ACNET readback N:1PTAIR.

- 3.3.2 Machine Protection System (MPS)
 - _____ Know that multiple systems are monitored.
 - _____ Moveable devices
 - _____ RF Gun water
 - _____ Beamline vacuum system
 - _____ 50 MeV chicane dipole currents
 - _____ 300 MeV dogleg dipole currents
 - _____ Beam switches - 3x in NML control room (x6450), 1x in MCR (x3721)
 - _____ 50 MeV beam dump water system and temperature
 - _____ 50 MeV spectrometer magnet (N:D122) NMR lock is monitored
 - _____ 300 MeV beam dump water system and temperature
 - _____ 300 MeV spectrometer magnet (N:D600) NMR lock is monitored.
 - _____ Beamline loss monitors
 - _____ Experimental devices may interface with the MPS.
 - _____ If the MPS permit trips, contact a FAST operations expert. (See call-in list)
- 3.3.3 Low-Conductivity Water (LCW)
 - _____ LCW is distributed from the northwest corner of NML
 - _____ A single pump is used at a time (Pump #1 or Pump #2)
 - _____ The pumps are controlled by PLC Touch Panel
 - _____ The electron gun skid taps from the main LCW distribution
- 3.3.4 Cryogenics
 - _____ Each SRF system (e.g. CC2) has a cryogenic permit
 - _____ A quench in one SRF cavity may impact others
- 3.4 Manipulating Devices
 - _____ Magnets
 - _____ 50 MeV Bend Dipoles
 - _____ 50 MeV Corrector trims
 - _____ 50 MeV Quadrupoles
 - _____ 300 MeV Bend Dipoles
 - _____ 300 MeV Corrector trims
 - _____ 300 MeV Quadrupoles
 - _____ Instrumentation (Movable Devices)

- _____ Faraday Cup
- _____ Cathode camera system
- _____ Transverse Profile Monitors (TPMs)
- _____ RF acceleration phases
- _____ Streak cameras
- _____ Contact an Operations Expert before manipulating:
 - _____ Vacuum/Gate Valves
 - _____ Bunch number
 - _____ Waveplate
 - _____ RF magnitudes

3.5

Controlled Access

- _____ Safety training requirements
 - _____ Rad Worker II
 - _____ Oxygen Deficiency Hazard (ODH)
- _____ Controlled Access is to be approved by an Operations Expert
- _____ Run the Turn-off sequencer aggregate (N43).
- _____ Check the beam power on all shift plots since the last access.
 - _____ If any toroid shows greater than 5 W consult an Operations Expert.

3.6

Call-in List

- _____ NML Operations Group (Experts)
 - _____ Dan Broemmelsiek (630) 746-4587
 - _____ Jinhao Ruan (630) 536-9028
 - _____ Chip Edstrom (630) 338-3708
 - _____ Darren Crawford (630) 882-8990
 - _____ Jamie Santucci (630) 910-1998

4.0

DISTRIBUTION

An electronic copy of this procedure shall be made available through the FAST Web Page (<http://fast.fnal.gov/>) and a signed hard copy shall be maintained in the NML Control Room.